

WHAT IS CLAIMED IS:

1. A probe station system for applying electrical test signals to an integrated circuit specimen, comprising:

platform means for positioning a high resolution microscope for observing a surface of the specimen exposing electrically conductive terminals on the specimen;

5 stage means for supporting the specimen in relation to the high resolution microscope;

imaging means for acquiring an image identifying conductive path indicia of the surface of the specimen from the high resolution microscope;

10 probe control means for remotely controlling a plurality of probes with said means for acquiring the image for conveying electrical test signals positionable on the surface of the specimen;

vacuum chamber means for generating a vacuum in a chamber having an inner enclosure for housing the specimen; and

15 feedthrough means for coupling electrical signals from said means for acquiring the image to said means for remotely controlling the plurality of probes via a feedthrough on the chamber, said imaging means communicating with said probe control means for remotely controlling the plurality of probes for applying electrical test signals to the terminals on the specimen using the acquired image to identify the electrically conductive terminals from the conductive path indicia of the surface of the specimen observed with the high resolution microscope.

2. A system as recited in claim 1 wherein said high resolution microscope comprises at least one of a scanning electron microscope and a focus ion beam system.

3. A system as recited in claim 1 wherein said stage means is coupled relative to a platen allowing raising and lowering of the plurality of probes facilitating viewing with said imaging means.

4. A system as recited in claim 1 wherein said imaging means for acquiring the image comprises a first computer.

5. A system as recited in claim 1 comprising a second computer, said probe control means for remotely controlling the plurality of probes comprises a motorized manipulator being remotely controlled by said second computer.

6. A system as recited in claim 4 wherein said probe control means for remotely controlling the plurality of probes comprises a motorized manipulator being remotely controlled by said first computer.

7. A system as recited in claim 4 wherein said specimen includes an integrated circuit wafer.

8. A probe station system for acquiring electrical test signals from an integrated circuit specimen, comprising:

a high resolution microscope positioned for observing a surface of the specimen exposing electrically conductive terminals on the specimen;

5 a carrier for supporting the specimen in relation to said high resolution microscope;

a computer for acquiring an image identifying conductive path indicia of the surface of the specimen from said high resolution microscope;

a motorized manipulator being remotely controlled by said computer;

10 a plurality of probes for conveying electrical test signals positionable on the surface of the specimen with said motorized manipulator;

a vacuum chamber having an inner enclosure for housing said high resolution microscope, said carrier, said motorized manipulator and said plurality of probes for analyzing said specimen in a vacuum; and

15 a feedthrough on said vacuum chamber for coupling electrical signals from said computer to said motorized manipulator and said plurality of probes, said computer communicating with said motorized manipulator for positioning said plurality of probes for applying and receiving electrical test signals via the terminals on the specimen using the image acquired with said computer to identify the electrically conductive terminals from the conductive path indicia of the surface of the specimen observed with said high resolution microscope.

9. A system as recited in claim 8 wherein said high resolution microscope comprises at least one of a scanning electron microscope and a focus ion beam system.

10. A system as recited in claim 8 wherein said carrier comprises a shielded integrated circuit chuck for supporting a wafer specimen.

11. A system as recited in claim 8 wherein said carrier comprises a thermal chuck.

12. A system as recited in claim 8 wherein said computer for acquiring the image comprises a personal computer (PC).

13. A system as recited in claim 8 comprising a motorized platform coupled to said carrier, said platform providing translational tip and tilt movement of said carrier for device and probe viewing.

14. A system as recited in claim 8 wherein said computer comprises an image processor associated with said high resolution microscope.

15. A system as recited in claim 8 wherein said computer is a general purpose personal computer.

16. A system as recited in claim 8 wherein said means for remotely controlling the plurality of probes comprises a motorized manipulator being remotely controlled by said personal computer.

17. A system as recited in claim 16 wherein said means for remotely controlling the plurality of probes comprises a multiplicity of motorized manipulators.

18. A system as recited in claim 8, wherein said plurality of probes comprises a fixed position probe card for applying electrical test signals to the specimen.

19. A method of analyzing an integrated circuit specimen, comprising the steps of:

positioning a high resolution microscope for observing a surface of the specimen exposing electrically conductive terminals on the specimen;

5 supporting the specimen in relation to the high resolution microscope;

acquiring an image identifying conductive path indicia of the surface of the specimen from the high resolution microscope;

remotely controlling a plurality of probes positionable on the surface of the specimen for conveying electrical test signals;

10 generating a vacuum in a chamber having an inner enclosure for housing the high resolution microscope and the plurality of probes for analyzing the specimen in a vacuum; and

coupling communication signals via a feedthrough on the chamber for applying electrical test signals to the terminals on the specimen using the image acquiring

15 step to identify the electrically conductive terminals from the conductive path indicia of the surface of the specimen observed with the high resolution microscope for positioning the plurality of probes with the step for remotely controlling the plurality of probes.

20. A method as recited in claim 19 wherein said step of acquiring the image provides a computer for acquiring the image identifying the conductive path indicia of the surface of the specimen using the high resolution microscope.

21. A method as recited in claim 20 wherein said step of remotely controlling the plurality of probes uses the computer of said image acquiring step for controlling a motorized manipulator for remotely controlling the plurality of probes positionable on the surface of the specimen for conveying the electrical test signals to the

5 specimen.

22. A method as recited in claim 21 comprising a step of providing a computer user interface for remotely controlling the plurality of probes with the computer for positioning the probes on the surface of the specimen.